

US EPA RECORDS CENTER REGION 5



482958

**HEALTH AND SAFETY PLAN
DUTCH BOY/INTERNATIONAL HARVESTER SITE
DEMOLITION**

**Prepared By:
HARZA ENVIRONMENTAL SERVICES, INC.**

**Prepared For:
City of Chicago
Department of Environment**

April 2, 1996

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ADMINISTRATIVE INFORMATION

Project Name: Dutch Boy/International Harvester Site Demolition Air Monitoring

Harza Project Number: 5593M

Harza Project Manager: Robert P. Kewer

Date of Issue: March 27, 1996

Effective Dates: April 3, 1996 to May 31, 1996

SIGNATURES:



Harza Project Manager

4/2/96
Date



Health & Safety Consultant

3/27/96
Date

This Site Safety and Health Plan (SSHP) was prepared in accordance with Occupational Safety and Health Administration (OSHA) requirements contained in 29 CFR 1910.20. The SSHP establishes guidelines and requirements for the health and safety of Harza field personnel during planned demolition activities at the Dutch Boy and International Harvester sites in Chicago, Illinois. The specific activities addressed by this plan are defined in Section 6.0. All Harza on-site personnel are required to read this plan and agree to abide by the provisions of this plan by signing the attached Employee Health and Safety Compliance Agreement provided in Appendix A. On-site Harza personnel must also comply with the Harza written Health and Safety Program. Copies of the SSHP will be kept on site for reference by field personnel.

The health and safety guidelines and requirements presented are based on a review of available information and an evaluation of potential hazards. This plan outlines the health and safety procedures and equipment required for activities at this site to minimize the potential for exposures of field personnel. This plan may be modified by the Project Manager or the Health and Safety Consultant (HSC) in response to additional information obtained regarding the potential hazards to field investigative personnel.

STAFF ORGANIZATION AND RESPONSIBILITIES

Project personnel include the following:

City of Chicago:	Project Manager	Kevin Staniel
Harza:	Project Manager	Robert P. Kewer
	Lead Engineer	Rudolpho Angellucci
	Site Manager/Safety Officer	Stephen Hempel
	Health & Safety Consultant	Atsushi Fujii, CIH

Chicago Project Manager. The City of Chicago's Project Manager will be Harza's principal contact with the city during the work and will be kept informed of progress and results. He also will have principal authority for interfacing with the public and the media, if required.

Harza Project Manager. The project manager is responsible for overall supervision of Harza personnel during the work and for coordinating communications between project personnel and the client. The project manager will be kept informed by the lead engineer and SSO as to progress and results of the air monitoring and of actions taken.

Harza Lead Engineer. The lead engineer is responsible for day-to-day direction to the Site Manager/SSO and for reviewing monitoring results. He also is responsible for providing any necessary on-site training in operation of monitoring instruments and sampling devices that may be required.

Health and Safety Consultant. The HSC is a certified industrial hygienist (CIH) with experience in hazardous waste site operations. He is responsible for overall surveillance of the Site Safety and Health Plan and is available to the field team should problems arise in these areas.

Harza Site Manager/Safety Officer. The Site Manager/Site Safety Officer (SSO) is responsible for field activities and implementing provisions of the SSHP. The SSO will give any site health and safety briefing that may be required prior to and during site work. The SSO has the authority to stop Harza field activities if conditions become unsafe. As Harza's on-site representative, the SSO will be responsible for appropriate notifications of air monitoring results, as may be required.

If other Harza field personnel are identified, they will have received applicable health and safety training and will be responsible for observing requirements of the SSHP while on site.

4.1 Basic Off-Site Training

Forty hours of off-site training or equivalent is required for all field personnel including subcontractor personnel. Training must meet the requirements of 29 CFR 1910.120 (e). Topics include:

- Safety, health, and other hazards associated with the site work.
- Bloodborn diseases.
- Use of personnel protective equipment, including necessary use of respirators.
- Work practices to minimize risk.
- Safe use of engineering controls and equipment.
- Medical surveillance requirements, including recognition of symptoms and signs indicating overexposure to hazards.
- Site control measures.
- Decontamination procedures.
- Emergency response plan and emergency equipment.
- Confined space entry procedures.

4.2 Field Training

Three days of actual field experience under the direct supervision of trained, experienced supervisors are required for all field personnel.

4.3 Refresher Training

Eight hours of annual refresher training are required for all field personnel. This training must occur within 12 months of the basic training course or the last refresher course.

SITE DESCRIPTION AND CONTAMINATION CHARACTERISTICS

5.1 Site Description

The Dutch Boy site occupies about 3½ acres at the southwest corner of South Peoria and 120th Street in the City of Chicago, Illinois (Figure 1). The International Harvester site occupies about 21 acres immediately west of the Dutch Boy site. Both are abandoned and partially demolished industrial facilities.

The Dutch Boy site was a lead and lead-based paint manufacturing facility which operated between 1894 and 1980. The only standing structure is the concrete and steel skeleton of a three story former mill building. Other areas contain pavements, foundations and other remnants of loading docks and buildings, piles of debris, and underground facilities such as basements, pipes and possible underground storage tanks. The site is not fenced. The site was partially demolished in 1983, but demolition was halted due to generation of dust containing lead and asbestos. An emergency removal was conducted in 1986 and 1987 by the Illinois EPA. Since then, several investigations and sampling programs have been conducted variably by the City of Chicago, Illinois EPA and U. S. EPA. Results have indicated the presence of elevated levels of lead in soils and asbestos. In the west part of the site, subsurface soils also were found to contain various organic chemicals typically associated with fuels and/or solvents.

The International Harvester site was a former heavy machine manufacturing facility which operated between 1903 and 1983. Most of the buildings on the site were demolished in 1983. The most significant structure remaining is an 80-foot high smokestack. Piles of debris are present from the razed structures. A 1988 screening site inspection by the Illinois EPA found low levels of PAH compounds and asbestos at the site. Several rounds of sampling between 1991 and 1995 by U. S. EPA have identified asbestos, PAHs, and low levels of volatile organics.

5.2 Chemicals of Concern

Based on results of previous investigations, principal contaminants of concern at the Dutch Boy Site have been lead and asbestos. Prior to any demolition work, asbestos abatement in the former mill building and the smokestack will be completed. Also, site areas immediately surrounding the mill building where asbestos and lead have been found will be protected by steel plates during the work to mitigate concerns which may arise from disturbance of these soils. Therefore, lead bearing dust which may be generated during demolition is the principal contaminant of concern for the Dutch Boy site and respirable dust for both sites.

At various locations around the site, lead has been detected in soil at concentrations as high as 50,000 mg/kg and commonly in excess of 1,000 mg/kg. Lead in paint chip samples from the Dutch Boy mill building ranged between 0.060 % and 16%. Lead in wipe samples from surfaces in the mill building ranged between 0.37 and 40 mg/cm².

Various volatile and semi-volatile organic chemicals also have been found in soils in parts of both sites. However, these areas, to the extent known, are not planned to be disturbed during the demolition work, and will not impact the air monitoring. Some of these chemicals include ethylbenzene (540 ug/kg), tetrachloroethene (48,000 ug/kg), trichloroethene (4,300 ug/kg), total xylenes (58 ug/kg), total petroleum hydrocarbons (33,333 mg/kg), naphthalene (180 ug/kg) and 2-methylnaphthalene (110 ug/kg).

Physical properties and health hazard characteristics of lead and other chemicals which may be encountered during the work are provided in Table 1.

5.3 Project Description

The project to be undertaken by the City includes: a) demolition and removal of the remnant mill building at the Dutch Boy site; b) demolition and removal of the smokestack at the International Harvester site; and removal of debris piles on the Dutch Boy site. Asbestos on the second floor of the mill building will be abated by the contractor prior to any demolition and steel plates will be placed to cover and protect nearby areas containing lead-contaminated soil. Air monitoring and air sampling for particulates and, at the Dutch Boy site, sampling for lead, will be conducted during the demolition by Harza. Harza's work activities are discussed in Section 6.0.

Harza's scope of services for the Dutch Boy/International Harvester demolition project is to provide perimeter air monitoring during the demolition work. Specific tasks include:

- Provide and install one (1) meteorological station capable of providing wind direction and speed. The station will be pole mounted and read visually each morning to allow proper placement of air sampling equipment.
- Provide, install, operate and conduct "real-time" monitoring using four (4) Mini-Ram (or equivalent) air samplers for the duration of the demolition. Parameters will be particulates at both sites and for the debris removal plus lead at the Dutch Boy site. "Real-time" monitoring will be for particulates.
- During demolition at both sites, collect and analyze in the laboratory samples of respirable dust (8 samples per day, 400 total samples assumed).
- During demolition at the Dutch Boy site, also collect and analyze in the laboratory samples of lead in air (8 samples plus 2 blanks per day, 300 total samples assumed).
- Provide notification to persons identified in this plan should perimeter air monitoring indicate an exceedence of actions levels identified in the SSHP (See Section 9.0).
- Prepare and submit a written report summarizing and presenting results of the air monitoring.
- Provide the services of a Certified Industrial Hygienist for consultation and review, as may be needed.

Mini-ram monitors will be located daily based on wind direction, one upwind and three downwind, at the perimeter of the active work zone. To the extent possible, monitors will be located at the perimeter fences, allowing visual access to the LED readout by interested third parties. The instruments will be located just inside the fences and will be demobilized each night and reinstalled the following morning. Harza's SSO will be responsible for setting up the instruments daily, for recording readings, and for collecting required air samples. Harza's SSO also will be responsible for notifying authorized city and other individuals should monitoring indicate an exceedence of an action level as discussed in Section 9.

7.1 Chemical Hazards

Chemical hazards expected to be encountered at this site include lead and respirable dust. Although site activities are not planned in areas known to be affected by volatile and semi-volatile organic chemicals, these also would be of potential concern if encountered. Physical properties and health hazard characteristics of chemicals which may be encountered at the site are shown in Table 1. Material Safety Data Sheets for chemicals of concern are provided in Appendix B.

The greatest risk of exposure is likely to occur during demolition of the smokestack and the remnant mill building. The potential routes of exposure include inhalation, dermal contact, and ingestion.

Potential for inhalation exposure is likely to be greatest during site activities which may generate dust. Dust control measures will be implemented by the demolition contractor as needed. Harza's primary task is to provide perimeter air monitoring and air sampling during this work to protect personnel from this hazard and determine that particulates exceeding established levels are not exiting the work site.

It is not expected that personnel will come into contact with significant amounts of contaminated materials due to the nature of the field activities to be conducted by Harza. Therefore, the potential for exposure to chemicals of concern is expected to be low for this exposure route. There is a possibility that airborne particulates contaminated with lead may be generated during dusty conditions. Also, organic chemicals were found in soil in a portion of the Dutch Boy site not expected to be disturbed by the work. Some solvents and fuels can be absorbed through the skin.

The potential for exposure to chemicals of concern by ingestion of contaminated materials is expected to be low. Personnel on site are expected to utilize good personal hygiene practices.

7.2 Physical Hazards

A. Demolition. The hazards involved with the planned demolition activities include the hazards typically associated with construction sites, including heavy equipment, as well as hazards associated with potentially unstable structures during the course of demolition. Harza field personnel should maintain a safe distance from contractor operations and operating equipment at all times and must be careful to communicate with demolition contractor personnel and heavy equipment operators regarding their location. Access to the work zones by residents and other visitors will be restricted by fencing.

B. Personal Protective Equipment. Personal protective equipment (PPE) which may be required for some activities places a physical strain on the wearer and may increase the risk of heat stress. In addition, PPE such as gloves and protective clothing limits manual dexterity and physical movement.

C. Noise. Work at this site will be conducted near demolition operations and heavy equipment which may expose personnel to high noise levels.

D. Slips, Trips, and Falls. Portions of the site are characterized by remnants of building foundations and walls, steep slopes, muddy or slippery surfaces, uneven ground, and open holes. These surface conditions pose significant hazard of injury by slips, trips, and falls.

E. Heat Related Hazards. Working during hot and humid weather may cause heat exhaustion, heat stress or heat stroke.

F. Cold Related Hazards. Working during cold weather may cause hypothermia or frost bite.

GENERAL HEALTH AND SAFETY REQUIREMENTS

8.1 Personnel Clearance

Harza employees must obtain health and safety clearances before beginning field work at the Site. Harza field personnel must have: (1) been certified by a Harza physician as being physically fit and able to perform their assigned field work; (2) successfully completed a 40-hour basic health and safety training course and subsequent 8-hour refresher courses; and (3) passed a respirator fit test with isoamyl acetate and/or irritant smoke as indicators.

8.2 Safety Briefings

Before field work begins, field personnel must be briefed by the SSO on their work assignments and safety procedures contained in this document. Each person must be provided with and read a copy of this SSHP. Attendees must sign a safety compliance agreement form stating that they have read, understand, and agree to comply with the provisions of this plan. Individuals refusing to sign the agreement will be prohibited from conducting field work during this investigation.

8.3 Site Visitors

The Site is located in proximity to residential areas and visitors may be expected. Because of the physical hazards associated with this site, the Work Zones will be fenced and visitors not involved with the work will not be allowed inside the fence and will be allowed on the property only with an escort. Visual access to the LED readout on air monitoring equipment will be provided at the fence perimeter, depending on wind conditions. Harza visitors entering the work zone will be required to read and verify compliance with the provisions of this SSHP. In the event that a visitor does not adhere to the provisions of the SSHP, he/she will be requested to leave.

8.4 Distribution of Health and Safety Plan

Before field work begins, a copy of this SSHP must be provided to each Harza employee assigned to field work on the project. The SSO is responsible for ensuring that a copy of the plan is available whenever work is in progress.

8.5 Accident/Incident Reporting

In the event of an accident or incident, the SSO will immediately notify the Harza Project Manager. Types of accidents or incidents that are considered reportable are:

- Illness resulting from chemical exposure or unknown causes,
- Physical injury, including an injury that does not require medical attention,
- Fire, explosions, and flashes resulting from activities performed by Harza,
- Infractions of safety rules and requirements, or
- Unexpected chemical exposures.

Work by Harza personnel will be suspended to correct the cause of the accident/incident and to modify this plan as necessary. Minor accidents/incidents will be noted in the field logbook.

8.6 Heat/Cold Stress Monitoring

The planned work will be conducted in early Spring when variable weather conditions may be expected. Therefore, field personnel will be prepared to address possible issues of cold and heat stress.

Cold stress monitoring will be implemented at any time the ambient temperature or the wind chill factor is 32° F or less. A wind chill table (cooling power of wind on exposed flesh, expressed as equivalent temperatures) is provided in Table 2. Cold stress monitoring will include recognizing warning symptoms, such as reduced coordination, drowsiness, impaired judgement, fatigue, or numbing of toes and fingers. Frequent breaks will be taken in warm areas to relieve workers from the cold.

Heat stress monitoring will be implemented at any time temperatures are 70° F, or above. The heat stress monitoring program will include recognizing warning symptoms such as rashes, cramps, discomfort and drowsiness, and impaired functional ability. Frequent breaks will be taken in cool areas to relieve workers from heat and to provide them with liquids. The monitoring program will also include the following physiological measurements: heart rate; oral temperature; skin temperature; and if possible, body weight.

8.7 Field Logbook

The SSO will maintain a field logbook which, among other information, will be used to record daily information pertaining to the site health and safety program. Information recorded will include weather conditions, monitoring instrument readings, records of initial and subsequent health and safety briefings, wind direction, levels of protection worn, and upgrades/downgrades in level of protection.

8.8 Work Zones

The demolition contractor will be responsible for establishing work zones at the site. Separate work zones will be provided around the area of the smokestack on the International Harvester property and around the remnant mill building on the Dutch Boy property. Construction fencing will be provided around these work zones. Work zones around debris piles to be removed are expected to be marked by tape or other means. Approximate work locations and work zones (planned fence lines) are shown on Figure 1. All Harza personnel are to observe these work zones. All air monitoring stations will be located just inside the fenced work zones. Harza personnel shall restrict their activities to inside the fenced work zones except for roadways providing entrance and exit. All Harza personnel who enter the work zones must be cleared by the SSO, have signed a safety compliance agreement form, and wear the level of protective equipment specified in Section 9.0 of this plan.

SITE-SPECIFIC HEALTH AND SAFETY REQUIREMENTS

9.1 Air Monitoring/Sampling Requirements

Prior to any demolition work at the site, but no more than 5 days before start of demolition, background levels of respirable dust will be determined using a Mini-ram air sampler. The background readings will be taken hourly from a location to be selected within the Dutch Boy property over an 8-hour period representative of normal work times. The 8-hour time weighted average will be determined and will become the background level for comparison to real-time monitoring results. Background air samples also will be collected and analyzed in the laboratory for respirable dust and lead. The samples will be collected from the same location used for real-time readings. Respirable dust samples will be collected on pre-weighted, 37-mm PVC filter cassettes using MSA air pumps fitted with a Gillian cyclone. Flow rate is 1.7 liters per minute. Lead air samples will be collected on 37-mm mixed cellulose ester (MCE) filter cassettes using MSA air pumps. Flow rate is 2.0 liters per minute. Samplers will be left in place for four hours each in the morning and afternoon. Results, when available, will be used to establish lead levels in air at the site with no demolition activities underway.

During demolition activities, Harza personnel will conduct perimeter air monitoring. Harza will establish a basic meteorological station within the site which will provide wind speed and direction. At the beginning of each work day during which demolition will take place, the wind direction will be recorded and four Mini-Ram air samples will be deployed accordingly. One of the Mini-Ram samplers will be placed upwind and three downwind. The samplers will be placed just inside the construction fencing to be installed by the contractor, but so that the LED display can be read from outside the fence.

The Mini-Rams will be operated in continuous record mode throughout the work day and will be downloaded at least nightly. In addition, Harza personnel will manually record in a field logbook the real-time readings of the respirable dust level at least hourly and at any other time when visible dust appears to be generated. The manual readings will be used to determine whether action levels are being exceeded.

Harza personnel also will collect samples of air for laboratory analysis. Samplers will be placed at each of the four Mini-ram locations and left in place for four hours in the morning and four hours in the afternoon, as described above. A total of eight (8) samples plus two (2) blanks for lead analysis and eight (8) for respirable dust analysis will be collected daily. Samples will be shipped or hand-delivered to the laboratory nightly. Each sample will be provided with a unique sample number which will be recorded in the field logbook along with the date and time collected, location and other relevant sample information. Chain-of-custody forms will accompany each shipment to the laboratory.

9.2 Action Levels

Action levels are identified as 1/2 of the NIOSH Permissible Exposure Limits, as follows:

Respirable Dust (real-time):	2.5 mg/m ³
Lead in air (laboratory) (Dutch Boy only):	0.025 mg/m ³

9.3 Notification in the Event Action Levels are Exceeded

Should action levels be exceeded at any time, the SSO will immediately notify the following individuals:

Mr. Kevin Staniel (Department of Environment)	312-744-3639
Mr. Chester Wilson (Alderman's office)	312-928-6961 (Pager: 359-2790)
Ms. Dionne Gilmore	312-821-4379
Ms. Helen Henderson	312-264-3090
Mr. John Em (R. H. Chen & Associates)	312-595-2005
Mr. James Van der Kloot (Department of Environment)	312-744-9139

The City may then direct that site activities cease until causes for the exceedences have been addressed.

9.4 Personal Protective Equipment

9.4.1 Levels of Personal Protection Which may be Required

Level D	Level D (Modified)	Level C
Hard Hat	Hard Hat	Hard Hat
Steel Toe and Shank Boots	Steel Toe and Shank Boots	Steel Toe and Shank Boots
Safety Glasses w/side shields or goggles	Safety Glasses w/side shields or goggles	Safety Glasses w/side shields or goggles
Hearing Protection	Hearing Protection	Hearing Protection
	Boot Covers	Boot Covers
	Uncoated Tyvek coveralls taped at ankles and wrists	Saranex-coated Tyvek coverall taped at ankles and wrists
	Nitrile Gloves (when handling materials)	Nitrile Gloves (when handling materials)
		Full face respirator with applicable cartridges

9.4.2 Initial Level of Protection and PPE Upgrades

Level D will be the initial level of protection for perimeter air monitoring with Modified level D used if muddy work conditions are encountered. Upgrades in this initial level of protection will be made, if necessary, based on air monitoring results and/or field observations in accordance with Section 9.3 of this SSHP. It is noted that any conditions which may require upgrade to Level C are also likely to require temporary cessation of the demolition activities (e.g. excessive dust generation, lead in dust, etc.).

9.4.3 Hearing Protection

Noise levels in excess of 85 dBA, 8 hour time weighted average will require hearing protection. Such levels may be associated with demolition or heavy equipment operations. Hearing protection is required during this investigation for exposures of greater than 90 dBA for any length of time. An appropriate rule of thumb is that when normal conversation is difficult at a distance of two to three feet, hearing protection is required. Harza personnel shall have hearing protection available on site.

9.5 Decontamination

Harza personnel shall take appropriate actions to avoid contact with any grossly contaminated material and it is not expected that decontamination activities will be required. However, decontamination of personnel, clothing, equipment and samples leaving the Work Zone may be required should personnel have contact with such material. Decontamination equipment shall be present on site for this purpose sufficient to wash and rinse boots, gloves and sampling equipment prior to placing equipment into a vehicle, as well as to discard used disposable items such as gloves and tyvek. Personnel are advised to shower as soon as possible after leaving the site.

9.6 Work Practices

9.6.1 Personnel Precautions

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the exclusion zone and the contamination reduction zone. The drinking of water, Gatorade, or equivalent fluids may occur in the CRZ at the discretion of the SSO after personnel have washed their hands and face.
- Smoking, carrying lighters and/or matches is prohibited in the exclusion zone and the contamination reduction zone.

- No jewelry may be worn by personnel engaged in field work, except for watches, which will be disposed of if they become contaminated.
- No facial hair which interferes with a satisfactory fit of the mask-to-face seal is allowed on personnel required to wear respirators or self-contained breathing apparatus (SCBAs).
- When respirators are worn, personnel will check the mask seal by positive and negative pressure tests daily. Respirator cartridges will be changed immediately upon odor breakthrough of airborne chemicals, or daily at a minimum. There will be no sharing of respirators between personnel.
- Contact lenses will be forbidden in Work Zones.
- Medicine and alcohol can enhance the effects from exposure to toxic chemicals. Prescribed drugs should not be taken by personnel on operations where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage intake will not be allowed during working hours or breaks.
- No person will enter an exclusion zone alone.
- No one will approach or enter areas or spaces where toxic or explosive concentrations of gases or dust may exist without proper equipment available to enable safety entry.
- Entry into trenches or confined spaces will not be permitted.
- Field personnel should remain aware of wind direction during field activities. Equipment set-up and sampling efforts should be directed so that workers remain upwind of potential sources of exposure.
- No activities will be permitted during periods of thunderstorms and lightning.
- Personnel will avoid areas where there is obvious discoloration of soil or water.
- All personnel must adhere to the information contained in the site Safety and Health Plan.

9.6.2 Buddy System

The "buddy system" will be used during all field work requiring the use of disposable coveralls and/or work around heavy equipment.

9.7 Communications

The SSO will have a cellular telephone on site during site activities.

10.1 Emergency Services

10.1.1 Emergency Phone Numbers

All Emergencies:		911
Hospital:	Roseland Community Hospital	312-995-3000
	45 West 111th Street	
	Chicago, Illinois	
Other:	Poison Control	800-952-0123
	ESDA (Emergency Service and Disaster)	800-782-7862

10.1.2 Hospital Route

The hospital route map is provided in Figure 2. The SSO will drive the hospital route prior to beginning site work. From the Dutch Boy site, proceed north to 119th Street approximately 200 yards. Turn right onto 119th Street and proceed east about 2 blocks to Halsted. Turn left on Halsted and proceed approximately 1 mile north to 111th Street. Turn right on 111th Street and drive approximately 1 mile to the Roseland Community Hospital, located about 2 blocks west of State Street.

10.1.3 Harza Contacts

• Robert P. Kewer, Project Manager	312-831-3812
• Rudolpho Angelucci, Lead Engineer	312-831-3835
• Atushi Fujii, Health and Safety Consultant	312-984-5055

10.2 Emergency Response Procedures

10.2.1 Emergency Medical Treatment

If an employee working in a contaminated area is physically injured, Red Cross first aid procedures will be followed. Depending on the severity of the injury, emergency medical response may be sought. If the employee can be moved, he/she will be taken to the edge of the work area where contaminated clothing will be removed (if possible) and emergency first aid administered, and then they will be transported to the hospital.

10.2.1.1 Emergency Medical Procedures. For severe injuries, illnesses, or overexposures:

- Remove the injured or exposed person(s) from immediate danger.
- If possible, at least partial decontamination should be completed. Wash, rinse, and/or cut off protective clothing and equipment and redress the victim in clean coveralls.
- If decontamination cannot be done, wrap the victim in blankets or plastic sheeting to reduce contamination of other personnel.
- Render emergency first aid and call an ambulance for transport to local hospital immediately. Notify emergency personnel of contaminants on-site. This information is in Appendix A and Section 4.0 and should be sent with the victim to the hospital.
- Evacuate other site personnel to a safe place until the SSO determines that it is safe to resume work.
- Report the accident to the PM and HSC immediately and complete an incident report.

For minor injuries or illnesses:

- Complete a full decontamination, if applicable.
- Administer first aid. Minor injuries may be treated on site, but all injuries will be examined by trained medical personnel. Victims of serious bites or stings will be taken to a medical center.
- Notify the PM and HSC immediately.

10.2.1.2 First Aid - Chemical Injury. If the injury to the worker is chemical in nature (e.g., overexposure), the following first aid procedures are to be instituted as soon as possible:

Eye Exposure If contaminated solid or liquid gets into the eyes, wash eyes immediately with sterile saline solution lifting the lower and upper lids occasionally. Continue eye wash for 15 minutes. Cover the eye with a dry pad and obtain medical attention immediately. (Contact lenses are not permitted in the exclusion zone.)

Skin Exposure If contaminated solid or liquid gets on the skin, promptly wash contaminated skin for 15 minutes using soap or mild detergent and water. If solids or liquid penetrate through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. Obtain medical attention immediately if symptoms warrant.

10.2.1.3 First Aid - Physical Injury.

Animal Bites	Thoroughly wash the wound with soap and water. Flush the area with running water and apply a sterile dressing. Immobilize affected part until the victim has been attended by a physician. See that the animal is kept alive and in quarantine. Obtain name and address of the owner of the animal. Report all animal bites to Military Public Health at 784-4053.
Burns (minor)	Do not apply vaseline or grease of any kind. Apply cold water applications until pain subsides. Cover with a wet sterile gauze dressing. Do not break blisters or remove tissue. Seek medical attention.
Burns (severe)	Do not remove adhered particles of clothing. Do not apply ice or immerse in cold water. Do not apply ointment, grease or vaseline. Cover burns with thick sterile dressings. Keep burned feet or legs elevated. Seek medical attention immediately.
Cramps	Have the victim rest in a cool place. Give cool water or commercial sports drink. Lightly stretch the muscle and gently massage the area.
Cuts	Apply pressure with sterile gauze dressing, and elevate the area until bleeding stops. Apply a bandage and seek medical attention.
Eyes (foreign objects)	Keep the victim from rubbing the eye. Flush the eye with water. If flushing fails to remove the object, apply a dry, protective dressing and consult a physician.
Fainting	Keep the victim lying down with feet elevated. Loosen tight clothing. If victim vomits, roll him onto his side or turn his head to the side. If necessary wipe out his mouth. Maintain an open airway. Bathe his face gently with cool water. Unless recovery is prompt, seek medical attention.
Fracture	Deformity of an injured part usually means a fracture. If fracture is suspected, splint the part as it lies. Do not attempt to move the injured part of the person. Seek medical attention immediately.
Frostbite	The symptoms of frost bite include lack of feeling in the infected area and skin appears waxy and cold to the touch, or is discolored. Handle the area gently. Do not rub the area. Warm the area by soaking the affected part in water no warmer than 105° F. Keep the frostbitten part in the water until it looks red and feels warm. Loosely bandage the area with dry, sterile dressing. Seek medical attention as soon as possible.
Heat exhaustion	Signals indicating heat exhaustion include cool, moist, pale or flushed skin, headache, nausea, dizziness, weakness, and exhaustion. Loosen any tight clothing, apply cool wet clothes, such as towels. If the victim is conscious, give cool water to drink. Let the victim rest in a comfortable position, and watch carefully for changes in his or her condition. The victim should not resume normal activities the same day. Refusing water, vomiting and changes in

	consciousness mean the victim's condition is getting worse. Seek medical attention immediately.
Heat stroke	It occurs most often when people ignore the symptoms of heat exhaustion. The signals of heat stroke include red, hot, dry skin; changes in consciousness; rapid weak pulse; and rapid shallow breathing. Immediate action must be taken to cool the body before serious injury and death occur. Seek medical attention immediately.
Hypothermia	Signals of hypothermia include shivering, numbness, glassy stare, apathy, and loss of consciousness. Remove any wet clothing and dry the victim. Warm the victim gradually by wrapping the body in blankets and moving him or her to a warm place. If the victim is alert give warm liquids to drink.
Snake Bites	Keep the bite area as low as possible. Transport the victim immediately to a medical facility.
Insect Bites	Remove "stinger" if present. Keep affected part down below the level of the heart. Apply ice bag. For minor bites and stings apply soothing lotions, such as calamine.
Puncture Wounds	If puncture wound is deeper than skin surface, seek medical attention. Serious infection can arise unless proper treatment is received.
Sprains	Elevate injured part and apply ice bag or cold packs. Do not soak in hot water. If pain and swelling persists, seek medical attention.
Unconsciousness	Never attempt to give anything by mouth. Keep victim flat, maintain an open airway. If victim is not breathing, provide artificial respiration by mouth to mouth breathing and call for an ambulance immediately.

10.2.2 Fire/Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the SSO or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- Use fire fighting equipment available on site to control or extinguish the fire; and,
- Remove or isolate flammable or other hazardous materials which may contribute to the fire.

Otherwise, immediate evacuation of the area is indicated. In the event of an explosion, all personnel shall be evacuated and the fire department notified. No one shall re-enter the area until it has been cleared by explosives safety personnel.

10.2.3 Natural Disasters

Natural disasters may occur at the site due to weather. These include lightning and high winds.

Lightning	Persons should not work in open areas, near trees or other equipment outside during lightning storms. Stop work until the storm passes. If possible, clear the site until the storm passes.
High Winds	If high winds are forecast, then the site should be cleared before the winds become hazardous. Workers should be instructed to go to an appropriate shelter.

In the event evacuation is necessary, account for all persons before leaving the site, proceed to the site access road and go to a pre-arranged meeting place. A car should be parked facing the access road as close as possible to Work Zone. Notify the PM of any work stoppage due to lightening and high winds.

10.3 Emergency Equipment and First Aid Requirements

Emergency equipment will be stored at appropriate locations selected during site mobilization and may be moved from one location to another based on changing locations of construction activities. Emergency equipment and first aid supplies will be kept upwind of the work to the extent possible and include:

- Portable telephone.
- Whistle or portable air horn.
- Fire Extinguisher (if not provided by contractor).
- Emergency Eye Wash: A box containing 10 bottles (12 oz each) of sterile saline solution. Bottles will be replaced if used.
- First Aid Kit
- Blanket.
- Drinking water, Gatorade, or the equivalent.
- Extra full set of PPE.

Table 1

**PHYSICAL PROPERTIES AND HEALTH HAZARD CHARACTERISTICS
OF CHEMICALS WHICH MAY BE ENCOUNTERED AT
DUTCH BOY FACILITY**

	PHYSICAL PROPERTIES			PEL ¹	HEALTH HAZARDS		
	IP ²	LEL ³	VP ⁴		SYMPTOMS	TARGET ORGANS	ROUTE OF ENTRY
<i>Lead</i>	NA	NA	0	0.05 ⁵ NA	Weak, lass, insom; facial pallor; pal eye, anor, low-wgt, malnut; constip, abdom pain, colic; anemia; gigital lead line; tremor; para wrist, ankles; encephalopathy; nephropathy; irrit eyes; hypotension	GI tract, CNS, kidneys, blood, gingival tissue	Inh, Ing, Con
<i>Respirable Dust</i>	NA	NA	NA	NA	Shortness of breath	Lungs	Inh
<i>Trichloroethene</i>	9.45	8.0	58	50 NA	Head, verti; vis dist, tremors, som, nau, vomit; irrit eyes; derm; card arrhy, pares; carc	Resp sys, heart, liver, kidneys, CNS, skin	Inh, Ing, Con
<i>Tetrachloroethene</i>	9.32	NA	14	25 NA	Irrit eyes, nose, throat; nau; flush face, neck; verti, dizz, inco; head, som; skin eryt; liver damage; carc	Liver, kidneys, eyes, upper resp sys, CNS	Inh, Ing, Con*
<i>Benzene</i>	9.24	1.3	75	1 30	Upper resp irrit; gastroenteritis; musc spasm; slow pulse, extrasystoles; hypokalemia; irrit eyes., skin; skin burns suspected human carcinogen	Heart, CNS, skin, resp sys. eyes	Inh, Ing, Con
<i>Ethylbenzene</i>	8.76	1.0	10	100 NA	Irrit eyes, muc meib; head; derm; narco, coma	Eyes, upper resp sys. skin, CNS	Eye, Skin, Breath, Swallow
<i>Toluene</i>	8.82	1.2	20	200 NA	Ftg. weak; conf, euph, dizz, head; dilated pupils, lac; ner, musc ftg, insomnia, derm	CNS, liver, kidneys, skin	Inh, Abs, Ing, Con
<i>Xylene o-</i>	8.56	1.1	7	100 NA	Dizz, excitement, drow, inco, staggering gait; irrit eyes, nose, throat; corneal vacuolization, anor, nau, vomit, abdom pain; derm	CNS eyes, GI tract, blood, liver, kidneys, skin	Inh, Abs, Ing, Con
<i>1,2-Dichlorobenzene</i>	9.06	2.2	1	6.11 NA	Irrit nose, eyes; liver, kidney damage; skin blister	Liver, kidneys, sin, eyes	Inh, Abs, Ing, Con

Table 1 (Continued)

PHYSICAL PROPERTIES AND HEALTH HAZARD CHARACTERISTICS
OF CHEMICALS WHICH MAY BE ENCOUNTERED AT
DUTCH BOY FACILITY

	PHYSICAL PROPERTIES			PEL ¹	HEALTH HAZARDS		
	IP ²	LEL ³	VP ⁴		SYMPTOMS	TARGET ORGANS	ROUTE OF ENTRY
Napthalene	8.12	.9	.08	50 0.2	Eye irrit; head.; conf, excitement, mal; nau, vomit, abdom pain; irrit bladder; profuse sweat; jaun; hema, hemog, renal shutdown; derm	Eyes, blood, liver kidneys, skin RBL, CNS	Inh, Ing, Abs

NOTES

¹PEL-Permissible Exposure Limit in Air (ppm)

²IP-Ionization Potential (eV)

³LEL-Lower Explosive Limit in Air (% by volume at room temperature)

⁴VP-Vapor Pressure at 68°F (mg Hg)

⁵mg/M³

* Not listed in National Institute for Occupational Safety and Health (NIOSH)
Guide to Chemical Hazards

⁷Route of Entry

Inh - Inhalation

Abs - Skin absorption

Ing - Ingestion

Con - Skin and/or eye contact

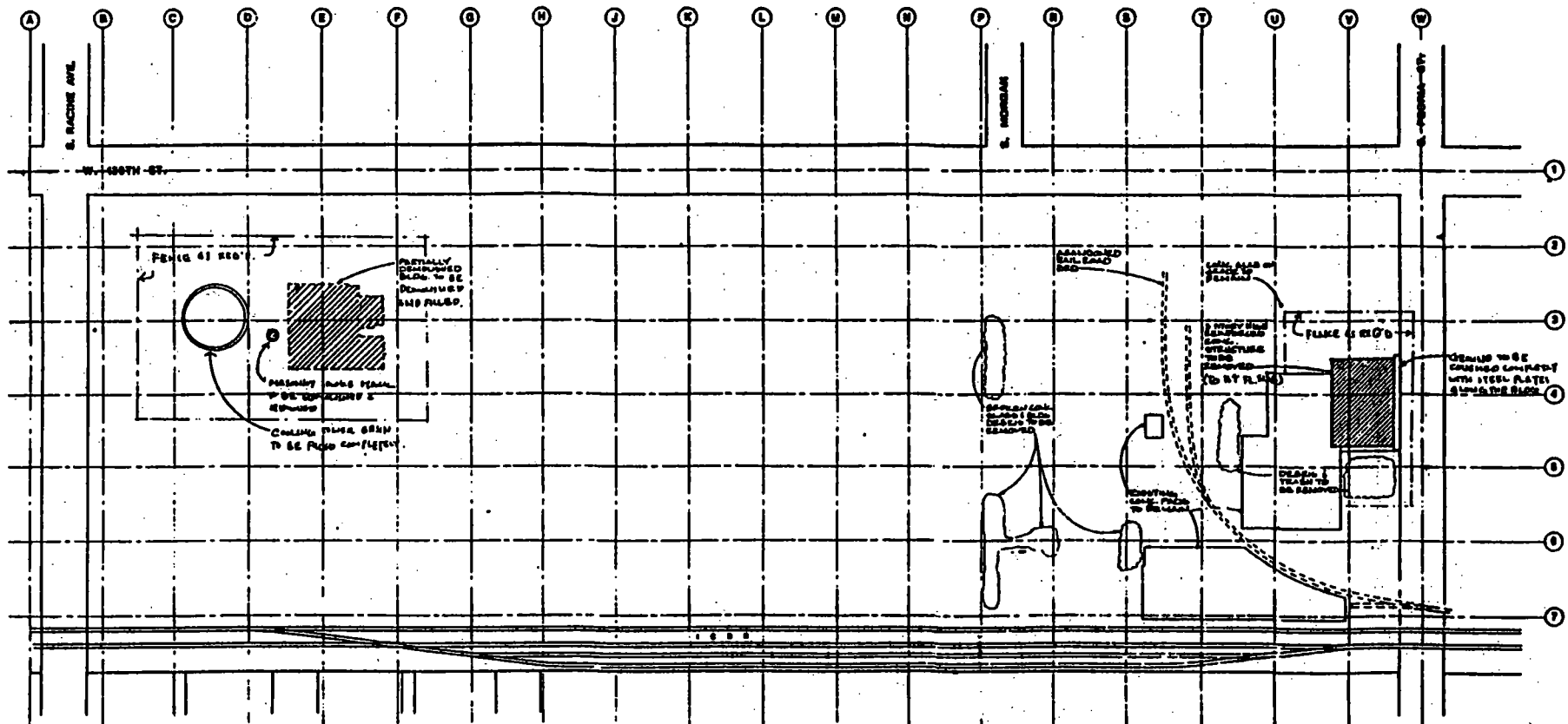
⁸ VP in torr.

Table 2
**COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED
 AS EQUIVALENT TEMPERATURE (Under Calm Conditions)***

Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature (under calm conditions)★												
Estimated Wind Speed (in mph)	Actual Temperature Reading (°F)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	Equivalent Chill Temperature (°F)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-3	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	LITTLE DANGER In < hr with dry skin. Maximum danger of false sense of security				INCREASING DANGER Danger from freezing of exposed flesh within one minute.				GREAT DANGER Flesh may freeze within 30 seconds.			
	Trenchfoot and immersion foot may occur at any point on this chart.											

* Developed by U.S. Army Research Institute of Environmental Medicine, Natick, MA.

☐ Equivalent chill temperature requiring dry clothing to maintain core body temperature above 36°C (96.8°F) per cold stress TLV.



SITE PLAN
SCALE: 0' 15' 30' 100'

1. EXISTING BUILDING FOOTPRINTS SHALL BE DEMOLISHED AND THE DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE. DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE.
2. THE EXISTING BUILDING AND TRAILER SHALL BE DEMOLISHED AND THE DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE. DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE.
3. FINAL GRADE FOR THE STRUCTURE SHALL BE DEMOLISHED AND THE DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE. DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE.
4. DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE. DEMOLITION SHALL BE COMPLETED WITHIN 180 DAYS OF THE DEMOLITION CONTRACT DATE.

100 - 1100 W. 130TH STREET / 1000 - 1000 S. RACINE AVE.	
DEMOLITION / SITE CLEARING PLAN	
THE CITY OF CHICAGO DEPARTMENT OF BUILDINGS	
R. M. CHEN & ASSOCIATES 100 - 1100 W. 130TH STREET / 1000 - 1000 S. RACINE AVE.	
DATE: 11-11-11	BY: [Signature]

Figure 1
SITE PLAN
Dutch Boy/IH Air Monitoring

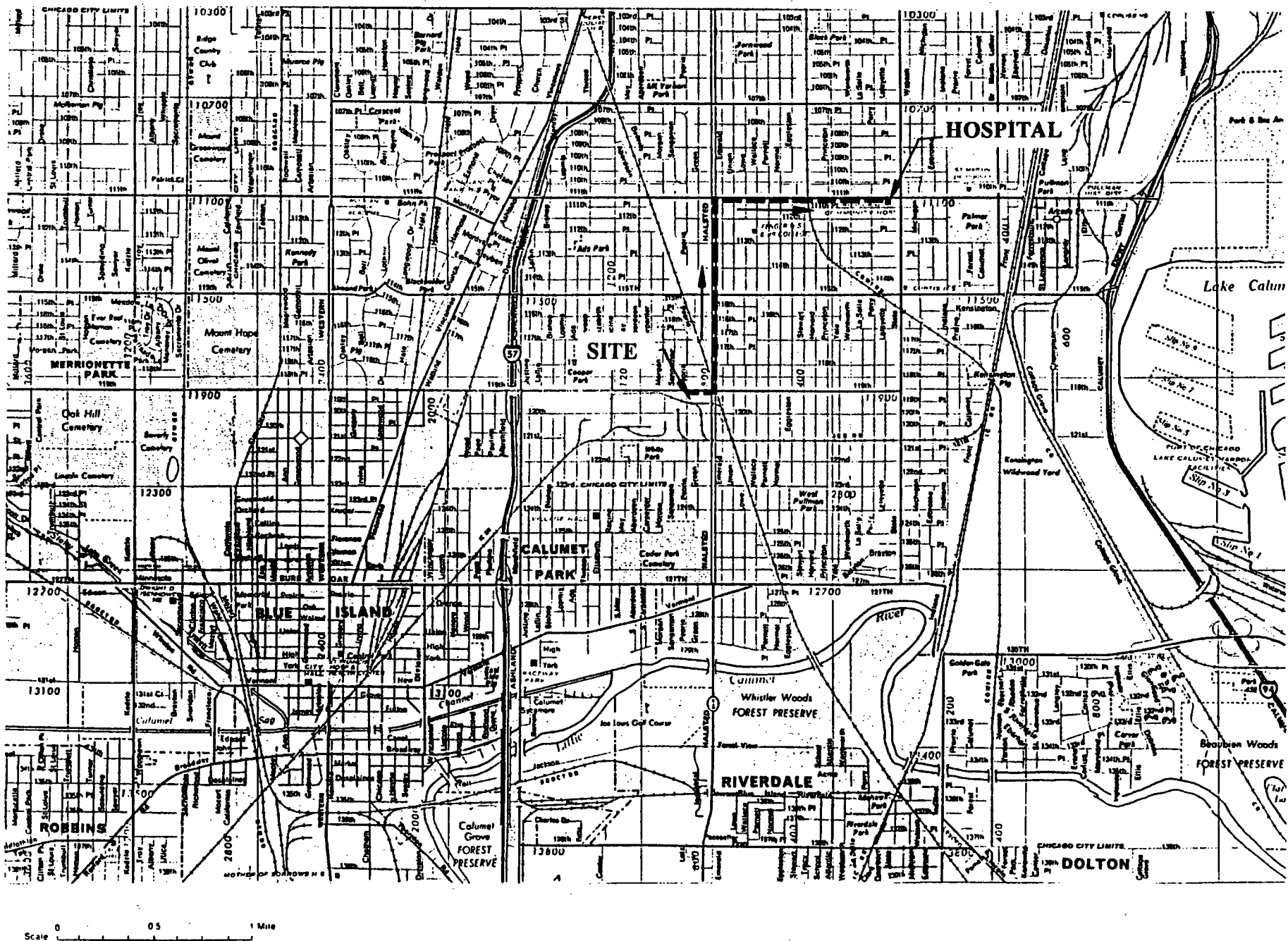


Figure 2
HOSPITAL ROUTE MAP
Dutch Boy/IH Air Monitoring

Appendix A

EMPLOYEE HEALTH AND SAFETY COMPLIANCE AGREEMENT

I, the undersigned, have received a copy of the Health and Safety Plan identified below. I have read the plan, understand it, and agree to comply with all of the health and safety directives. I have attended a site briefing given by the Site Safety Officer or Health and Safety Officer. I understand that I may be prohibited from working on the project for violating any of the directives.

Project No. 5593M

Site Name Dutch Boy Facility

Employee Name _____

Firm _____

Signature

Date

OCCUPATIONAL SAFETY AND HEALTH GUIDELINE FOR INORGANIC LEAD

INTRODUCTION

"Inorganic lead" is defined as lead oxides, metallic lead, and lead salts (including organic salts such as lead soaps but excluding lead arsenate). This guideline summarizes pertinent information about inorganic lead for workers, employers, and occupational safety and health professionals who may need such information to conduct effective occupational safety and health programs. Recommendations may be superseded by new developments in these fields; therefore, readers are advised to regard these recommendations as general guidelines.

SUBSTANCE IDENTIFICATION

- **Formula:** Pb
- **Synonyms:** C.I. pigment metal 4, C.I. 77575, KS-4, lead flake, lead S2
- **Identifiers:** CAS 7439-92-1; RTECS OF7525000; DOT 1794
- **Appearance and odor:** Bluish-white, silvery, or gray odorless solid

CHEMICAL AND PHYSICAL PROPERTIES

- **Physical data**
 1. Molecular weight: 207.19
 2. Boiling point (at 760 mmHg): 1,740°C (3,164°F)
 3. Specific gravity (water = 1): 11.34
 4. Melting point: 327.5°C (621.5°F)
 5. Insoluble in water
- **Reactivity**
 1. Incompatibilities: Lead reacts vigorously with oxidizing materials. Contact with hydrogen peroxide or active metals such as sodium or potassium may cause fires or explosions.
 2. Hazardous decomposition products: Toxic fumes (e.g., lead oxide) may be released in a fire involving inorganic lead.
- **Flammability**
 1. Extinguishant: Dry sand, dry dolomite, or dry graphite
 2. Caution: Lead is combustible in powder form when exposed to heat or flame

- **Warning properties**

Evaluation of warning properties for respirator selection: Based on lack of information on odor threshold and eye irritation levels, inorganic lead should be treated as a chemical with poor warning properties.

EXPOSURE LIMITS

The current Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) for inorganic lead is 50 micrograms of lead per cubic meter of air ($\mu\text{g}/\text{m}^3$) as a time-weighted average (TWA) concentration over an 8-hour workshift. If a worker is exposed to lead for more than 8 hours in any workday, the PEL, as a TWA for that day, shall be reduced according to the following formula: maximum permissible limit (in $\mu\text{g}/\text{m}^3$) = 400 divided by hours worked in the day. The National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) is 100 $\mu\text{g}/\text{m}^3$ as a TWA for up to a 10-hour workshift, 40-hr. workweek. The American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV®) is 0.15 mg/m^3 (150 $\mu\text{g}/\text{m}^3$) as a TWA for a normal 8-hour workday and a 40-hour workweek (Table 1).

Table 1.—Occupational exposure limits
for inorganic lead

	Exposure units $\mu\text{g}/\text{m}^3$
OSHA PEL TWA	50
NIOSH REL TWA	100*
ACGIH TLV® TWA	150

* Air level to be maintained such that worker blood lead remains $\leq 60 \mu\text{g}/100\text{g}$.

HEALTH HAZARD INFORMATION

- **Routes of exposure**

Inorganic lead may cause adverse health effects following exposure via inhalation or ingestion.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service Centers for Disease Control
National Institute for Occupational Safety and Health
Division of Standards Development and Technology Transfer

latency, the need for medical surveillance may extend well beyond termination of employment.

- **Sentinel health events**

1. Acute SHE's include: Acute renal failure.
2. Delayed-onset or reproductive SHE's include: Inflammatory and toxic neuropathy and chronic renal failure.

MONITORING AND MEASUREMENT PROCEDURES

- **TWA exposure evaluation**

Measurements to determine worker exposure to inorganic lead should be taken so that the TWA exposure is based on a single entire workshift sample or an appropriate number of consecutive samples collected during the entire workshift. Under certain conditions, it may be appropriate to collect several short-term interval samples (up to 30 minutes each) to determine the average exposure level. Air samples should be taken in the worker's breathing zone (air that most nearly represents that inhaled by the worker).

- **Method**

Sampling and analysis may be performed by collecting inorganic lead with cellulose membrane filters followed by acid digestion and analysis by atomic absorption. A detailed sampling and analytical method for inorganic lead may be found in the *NIOSH Manual of Analytical Methods* (method number 7082).

PERSONAL PROTECTIVE EQUIPMENT

Chemical protective clothing (CPC) should be selected after utilizing available performance data, consulting with the manufacturer, and then evaluating the clothing under actual use conditions.

Workers should be provided with and required to use CPC, gloves, face shields (8-inch minimum) and other appropriate protective clothing necessary to prevent skin contact with inorganic lead.

Workers should be provided with and required to use dust-proof safety goggles where inorganic lead may come in contact with the eyes.

SANITATION

Clothing which is contaminated with inorganic lead should be removed immediately and placed in closed containers for storage until it can be discarded or until provision is made for the removal of inorganic lead from the clothing. If the clothing is to be laundered or cleaned, the person performing the operation should be informed of inorganic lead's hazardous properties.

Change and shower rooms should be provided with separate locker facilities for street and work clothes.

Skin that becomes contaminated with inorganic lead should be promptly washed with soap and water.

The storage, preparation, dispensing, or consumption of food or beverages, the storage or application of cosmetics, the

storage or smoking of tobacco or other smoking materials, or the storage or use of products for chewing should be prohibited in work areas.

Workers who handle inorganic lead should wash their faces, hands, and forearms thoroughly with soap and water before eating, smoking, or using toilet facilities.

COMMON OPERATIONS AND CONTROLS

Common operations in which exposure to inorganic lead may occur and control methods which may be effective in each case are listed in Table 2.

Table 2.—Operations and methods of control for inorganic lead

Operations	Controls
During primary (ore) and secondary (scrap) smelting of lead; during the manufacture of storage batteries; during typecasting and remelting of type metal in printing	Process enclosure, local exhaust ventilation, dust control, personal protective equipment
During soldering in the fabrication of metal articles	Process enclosure, local exhaust ventilation, personal protective equipment
During melting and pouring of lead and alloys containing lead; during welding, burning, and cutting of metal structures containing lead or painted with lead containing surface coatings	Local exhaust ventilation, personal protective equipment
During the use of lead in the manufacture of surface coatings, including paints and varnishes; during the manufacture of ceramics and glass	Local exhaust ventilation, personal protective equipment

EMERGENCY FIRST AID PROCEDURES

In the event of an emergency, remove the victim from further exposure, send for medical assistance, and initiate emergency procedures.

- **Eye exposure**

Where there is any possibility of a worker's eyes being exposed to inorganic lead, an eye-wash fountain should be provided within the immediate work area for emergency use.

If inorganic lead gets into the eyes, flush them immediately with large amounts of water for 15 minutes, lifting the lower and upper lids occasionally. Get medical attention as soon as possible. Contact lenses should not be worn when working with this compound.

**FIELD RESPIRATOR PRESSURE TESTS AND GENERAL PROCEDURES
FOR RESPIRATOR CARE AND CLEANING**

FIELD RESPIRATOR PRESSURE TESTS AND GENERAL PROCEDURES FOR RESPIRATOR CARE AND CLEANING

1. FITTING

Place the respirator over the face and draw the straps securely. The mask should not be so tight as to cause discomfort or a headache. Secure bottom straps first.

2. NEGATIVE PRESSURE TEST

This test (and the positive pressure test) should be used only as a very gross determination of fit. The wearer should use this test just before entering the hazardous atmosphere. In this test, the user closes off the inlet of the canister, cartridge(s), or filter(s) by covering with the palm(s) or squeezing the breathing tube so that it does not pass air; inhales gently so that the facepiece collapses slightly; and holds breath for about 10 seconds.

If the facepiece remains slightly collapsed and no inward leakage is detected, the respirator is probably tight enough. This test, of course, can only be used on respirators with tight-fitting facepieces.

Although this test is simple, it has severe drawbacks; primarily that the wearer must handle the respirator after it has supposedly been positioned on his face. This handling can modify the facepiece seal.

3. POSITIVE PRESSURE TEST

This test, similar to the negative pressure test, is conducted by closing off the exhalation valve and exhaling gently into the facepiece. The fit is considered satisfactory if slight positive pressure can be built up inside the facepiece without any evidence of outward leakage. For some respirators, this method requires that the wearer remove the exhalation valve cover; this often disturbs the respirator fit even more than does the negative pressure test. Therefore, this test should be used sparingly if it requires removing and replacing a valve cover. The test is easy for respirators whose valve cover has a single small port that can be closed by the palm or a finger.

4. INSPECTION

On air-purifying respirators, thoroughly check all connections for gaskets and "O" rings and for proper tightness. Check the condition of the facepiece and all its parts, connecting air tube, and headbands. Inspect rubber elastomer parts for pliability and sign of deterioration.

Maintain a record for each respirator inspection, including date, inspectors, and any unusual conditions or findings.

5. CLEANING AND DISINFECTION

- Remove all cartridges, canisters, and filters, plus gaskets or seals not affixed to their seats.

- Remove elastic headbands.
- Remove exhalation cover.
- Remove speaking diaphragm or speaking diaphragm-exhalation valve assembly.
- Remove inhalation valves.
- Wash facepiece and breathing tube in cleaner/sanitizer powder mixed with warm water, preferably at 120° to 140°F. Wash components separately from the facemask, as necessary. Remove heavy soil from surfaces with a hand brush.
- Remove all parts from the wash water and rinse twice in clean warm water.
- Air dry parts in a designated clean area.
- Wipe facepieces, valves, and seats with a damp lint-free cloth to remove any remaining soap or other foreign materials.

NOTE: Most respirator manufacturers market their own cleaners/sanitizers as dry mixtures of a bactericidal agent and a mild detergent. One-ounce packets for individual use and bulk packages for quantity use are usually available.

6. REPAIRS

Only a trained person with proper tools and replacement parts should work on respirators. No one should ever attempt to replace components or to make adjustments or repairs beyond the manufacturer's recommendations. It may be necessary to send high-pressure-side components of SCBA's to an authorized facility for repairs.

Make repairs as follows:

- Replace all faulty or questionable parts or assemblies. Use parts only specifically designed for the particular respirator.
- Reassemble the entire respirator and visually inspect the completed assembly.
- Insert new filters, cartridges, or canisters, as required. Make sure that gaskets or seals are in place and tightly sealed.

7. STORAGE

Follow manufacturers' storage instructions, which are always furnished with new respirators or affixed to the lid of the carrying case. In addition, these general instructions may be helpful:

- After respirators have been inspected, cleaned, and repaired, store them so to protect against dust, excessive moisture, damaging chemicals, extreme temperatures and direct sunlight.

- Do not store respirators in clothes lockers, bench drawers, or tool boxes. Place them in wall compartments at work stations or in a work area designated for emergency equipment. Store them in the original carton or carrying case.
- Draw clean respirators from storage for each use. Each unit can be sealed in a plastic bag, placed in a separate box, and tagged for immediate use.

LIMITATIONS

Following is a partial list of gaseous materials for which chemical cartridge respirators should not be used for respiratory protection regardless of concentration or time of exposure; this far-from-complete list is offered only as a guide to proper evaluation of the many contaminants found in industry. Contact MSA for further information on other specific materials.

Acrolein	Hydrogen Sulfide	Ozone
Aniline	Methanol	Phosgene
Arsine	Methyl Bromide	Phosphine
Bromine	Methyl Chloride	Phosphorous
Carbon Monoxide	Methylene Chloride	Trichloride
Dimethylaniline	Nickel Carbonyl	Stibine
Dimethyl Sulfate	Nitro Compounds:	Sulfur Chloride
Hydrogen Cyanide	Nitrobenzene	Toluene
Hydrogen Fluoride	Nitrogen Oxides	Diisocyanate
Hydrogen Selenide	Nitroglycerin	Vinyl Chloride
	Nitromethane	

Reference: *8-Hour Refresher Program for Hazardous Waste Site Personnel, Version II, Student Handbook, Midwest Consortium for Hazardous Waste Worker Training, June 1989.*